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ABSTRACT

This study evaluated the mathematics and reading/language arts curriculum for grades 6 through 8 in an Illinois private school for gifted students. Emphasis was on determining whether the current curriculum meets the needs of these students and whether students are challenged to develop problem solving and critical thinking skills. Evaluation was within the framework of three models of gifted education: the content mastery model, the concept based model, and the process/product model. The qualitative research methodology employed involved interviews with five teachers and 15 students in each of the three grades. In addition, reading/language arts and mathematics classes were observed at least twice for each grade. The study found that, overall, the mathematics and language arts curricula are comprehensive, effective, challenging, creative, and meet the needs of students. The curriculum focuses on the development of the thinking process, is integrative, and allows for independent study and projects. Both the language arts and mathematics curricula incorporate the content mastery and concept based model. In addition, the mathematics curriculum fosters the process/product model. (Contains 19 references.) (DB)

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Meeting The Needs of The Gifted Student in Language Arts and Mathematics: An Evaluative Exploration

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Meeting the Needs of the Gifted Student in Language Arts and Mathematics: An Evaluative Exploration

Chapter 1

Introduction and Significance

Educational reform depends on our ability to challenge students to work harder and master more complex tasks. This challenge enhances problem solving and critical thinking skills as we move into the twenty-first century. There is little argument against the above for students performing at the low or average range. However, we must also challenge our top-performing students to even greater heights if our nation is to achieve a world class educational system (Ross, 1993). America relies on its top-performing students to provide leadership in science, writing, economics, politics, arts, business, history, health, and other human pursuits.

There are a number of compelling arguments for changing the way we educate our gifted and talented students. Compared with top-performing students in other countries, American gifted and talented perform poorly on international tests, have a less rigorous curriculum, and enter the work force ill prepared. In addition, not enough American students perform at the highest levels on National Assessment of Educational Progress tests (Ross, 1993).

Public education has not responded to the needs of the gifted and talented. In answer to their needs private schools have been organized solely for these top-performing students. These private schools are faced with the task of preparing the gifted student for post-secondary educational facilities. The question facing many private schools is whether their curriculum is challenging enough to meet the needs of the gifted student. These schools are also concerned with providing an enriched curriculum while attempting to fulfill the standards of public institutions and schools of higher learning.

Problem Statement

The purpose of this study was to evaluate the mathematics and reading /language arts curriculum for grades six through eight in a private gifted school in Central Illinois.

Research Questions

This study sought to answer the following questions:

Does the mathematics and reading/language arts curriculum for grades six through eight meet the needs of the gifted and talented student?

Does the mathematics and reading/language arts curriculum for grades six through eight challenge the gifted and talented student to reach the highest level of problem solving and critical thinking skills?

Chapter 2

Review of Literature

Overview

For some time the United States has been wasting one of its most precious resources, the gifts and talents of many students within the American school system. These students are not being challenged to the fullest range of their intellectual and artistic talents. These gifted students span across all cultures and socioeconomic levels. The best they can hope for are private schools for the gifted.

Even among the private schools for the gifted, administrators, board members, teachers, and parents struggle with what is the best curriculum that will serve the needs of these students. The research indicates that no one instructional model is sufficient for instructing the gifted student. Rather a combination of styles and techniques is recommended to meet the needs of these students.

Overall, a curriculum for the gifted must meet the needs of their unique learning styles. Kaplan (1986) states the curriculum for the gifted should be a match between recognized needs, abilities, and interests of the gifted student along with the purposes and expectations held by the educational establishment. In his book entitled "Comprehensive Curriculum for Gifted Learners," Van Tassel-Baska (1988) identifies four basic assumptions for a school's commitment to a curriculum for the gifted.

First, the regular school curriculum; as currently developed; is inadequate and inappropriate for the gifted student. Second, the general curriculum should be modified by the deletion and addition of material. Third, curriculum development for the gifted is a process that involves adaptation of current curriculum and the infusion of appropriate gifted curricular. Lastly, curriculum for the gifted must be written and communicated to all within a school district.

When discussing paradigms for instructing the gifted child three major models are discussed in research. The first is the "content mastery model," whose goal is to have gifted students progress through a curriculum at an accelerated rate. Information that these students have mastered is eliminated from a particular unit of study. They are accelerated by moving up a grade level in textbook and instructional materials. With this model the gifted student does not examine an area of study fully they just do it faster (Berube, 1994).

The "process/product," model develops skills students need to conduct first hand investigations of interesting topics. The students develop solutions to real world problems. This model reflects what a student has learned about a topic by presenting evidence to an interested audience. There is no set curriculum and emphasis is placed on in depth study of a topic rather than acceleration (Berube, 1994).

The third approach known as the "epistemological model," or the "concept-based model," places emphasis on the understanding of systems of knowledge as opposed to particular factual information. The students focus on the thoughts and principles that have influenced human development. This model emphasizes the importance of relating key issues to a variety of subject areas across the curriculum. The teacher poses questions that stimulate the students into discussion and higher levels of understanding.

No one model is completely effective nor does one particular model lend itself to all curricular areas for the gifted. A multidisciplinary approach to the curriculum is needed. This approach must correspond to the needs of the gifted child. Gifted students learn best when information is presented globally. A multidisciplinary approach reinforces the characteristics of the gifted learner. These characteristics include: the ability to make relationships between disparate pieces of information; the ability to move from concrete facts to abstract concepts; and the increased concern for "adult" issues and problems (Gozzer, 1982).

A curriculum for the gifted student should have certain underlying assumptions. According to the work of Jacobs and Borland (1986) these assumptions are :

1. Gifted students should explore epistemological issues.
2. A curriculum for the gifted should be reflective of a discipline field and an interdisciplinary orientation.
3. Curriculum and instruction for the gifted should include a dimension that focuses on the development of the thinking processes.
4. The Interdisciplinary Concept Model should be the precursor to independent study.
5. Gifted students can, and in many cases should, be involved in the development of interdisciplinary units.

Researchers have indicated that there are significant gains in student achievement when students become aware of the relationships between subjects. Consequently, a child's motivation, understanding, problem solving, and thinking process increases (Reihs & Ramirez, 1987). A multidisciplinary approach for the gifted student allows comprehension as to the significance of one occurrence from one situation to the next. It also provides an understanding of the correlation between unrelated disciplines (White, 1981).

An effective interdisciplinary curriculum is action centered and blends concepts from all disciplines. It allows students to solve realistic yet challenging problems (Melle & Wilson, 1984). It is student centered and prepares students for the future by emphasizing risk taking, inductive reasoning, experimentation, and interpretations.

Jacobs and Borland (1986) state that interdisciplinary curriculums are generally viewed as an either or proposition. This is incorrect. Gifted students need to acquire the knowledge, skills, and language of the various disciplines as well as the

vantage point and integrating dynamics of an interdisciplinary approach.

Mathematics For the Gifted

Talent in mathematics is demonstrated in many ways. Yet, being gifted in math has often been defined as scoring above the 95th percentile on a standardized test. This is an extremely narrow definition of giftedness and may be the reason for the small number of successful mathematicians born and raised in the United States (Sheffield, 1994).

Mathematically gifted students view the world from a mathematical viewpoint. They strive to make sense of the world by noticing spatial and quantitative relationships and connections in everything. Characteristics of mathematical talents include: fast learning pace, keen observation skills, powerful questioning skills, exceptional reasoning capacity, and creativity (Sheffield, 1994). Characteristics specific to mathematics generally include the following:

1. Ability to perceive, visualize, and generalize patterns and relationships.
2. Ability to reverse reasoning processes and to switch methods easily.
3. Keen awareness, curiosity, and understanding about quantitative information.
4. Ability to reason analytically, deductively, and inductively.
5. Persistence in solving difficult problems
6. Ability to work with mathematical concepts in fluent, flexible, and creative ways.
7. Ability to transfer learning to novel situations.
8. Ability to organize and work with data in a variety of ways and to disregard irrelevant data.
9. Ability to formulate mathematical questions not just answers (House, 1987)

Sheffield (1987) in developing the standards for the mathematically gifted, outlined the definition of gifted mathematical talent, identification procedures,

curriculum, teaching, and assessment. These recommendations will be summarized here.

Mathematical Giftedness

In order for students to demonstrate that they are capable of top mathematical performance the following needs to occur:

1. Students must be given a wide variety of rich inviting tasks that require spatial as well as analytic abilities. Good mathematicians must be skilled in both.
2. Students must be encouraged to persist in solving mathematical problems. Difficult tasks require work even for the gifted student.
3. Students should be able to pose and solve new problems of their own. They cannot be merely asked to answer questions and compute.

Identification

Identification of the gifted student in math should include the following:

1. The use of a variety of measures. Standardized tests measure only a narrow low level range of skills.
2. Assessment tasks must go beyond computation. These tasks generally cannot be measured by paper and pencil tasks or multiple choice tests.
3. There needs to be a wide range of opportunities including exciting classes mathematics clubs, and contests where students can hone and demonstrated their skills.

Curriculum

Curriculum for the gifted student in math is critical and should have the following characteristics:

1. A core curriculum that all students follow with an exploration of topics in more depth, drawing generalizations, and creating new problems and solutions related to the topic.

2. Students must have access to technology and manipulatives.

3. Examples of superior work should be availab'e so the students have something to strive for.

4. There needs to be a variety of rich and challenging programs.

Teaching

Teachers are the most important factor in the educational development of the gifted student. Teachers should consider the following recommendations:

1. All teachers should encourage students to construct their own mathematical understanding. Teachers must insist on the highest level of construction.

2. Teachers must have adequate resources and support to obtain the materials, technology, and training they need.

3. Parents and teachers must challenge students to increasing levels of mathematical achievement. Teachers should show exemplary work from previous students so students have examples of what can be accomplished.

Assessment

1. Assessment should include observations and responses to questions that are open ended and allow students to explain their reasoning. Performance tasks should include writing and drawings of their work.

2. Examination of student products is crucial and should include a review of math journals, portfolios, presentations, math fairs, demonstrations, and computer programs.

Research has demonstrated that acceleration of a math curriculum for the gifted is insufficient and only leads to the promotion of low level math skills. Gifted students need to go beyond acceleration and have a variety of rich inviting tasks that require spatial as well as analytic abilities. Gifted students need a combination of acceleration and enrichment that allows them to be challenged, solve, and pose

questions of their own (Sowell, 1993).

Reading /Language Arts For the Gifted

Gifted students are generally highly verbal and enjoy speaking, writing, and listening. They have a large fund of information. They are able to manipulate abstract symbols that allow for investigating the area of language. Adaption of a reading and language arts curriculum is not that simple, since historically reading/language arts have been skill based. Most reading programs for the gifted student have the same basal reader used by all students. The curriculum is broken down into the act of reading; such as distinguishing vowel sounds, identifying the main idea of a paragraph, and predicting the outcome of the story (Mangieri & Madigan, 1984). The reading/language arts curriculum for the gifted child needs redirection. Although the gifted child needs to acquire basic skills the focus of the program must go beyond basic skills.

Reading/Language Arts curriculums for the gifted needs to emphasize self-direction, product, and performance components. Despite arguments to the contrary gifted students benefit from individualized reading programs. These programs permit the students' interest to determine the selection of materials. Research has shown that interest affects the reading comprehension skills of the gifted child as well as their attitudes (Stevens, 1980). The gifted student will select material of appropriate difficulty and move through it quickly when provided with freedom of choice versus the confinement of grade level materials. Individualized reading is also necessary so the gifted student may engage in investigative study and independent projects. Opportunities for independent research projects are crucial to the gifted student. Therefore, an individualized reading program combined with research and independent projects creates the type of challenging curriculum needed for the gifted student (Robinson, 1996).

Writing is also part of the language arts curriculum. Writing needs to go

beyond the creative writing discourse of fiction and poetry. Written expression needs to occur in a variety of ways. It needs to be informative, persuasive, narrative, non-fiction, fiction, poetic and requires active teacher interaction.

Technical writing is an area that tends to be left untouched even when it comes to the gifted student. Yet, technical writing when broadly defined encompasses the technological, business, and scientific domains. It is rich with possibilities for the gifted student. Through technical writing students learn how to state research questions and hypothesis, identify resources, and write concise research proposals. Students in their conclusions of their research may write a brief technical paper. Through this process they learn how to present data in graphs, tables, and statistical forms. Gifted students are capable of this type of writing provided they are given examples, model reports, and teacher assistance (Robinson, 1996).

The writing process model that has been in public and private schools for several years now is of extreme benefit to the gifted student. The process model focuses on what children do as they write rather than just the end product. Children become real authors by being encouraged to select their own topics and work through their stories. This includes proofreading and editing. It includes publication of the final product in the school paper, library, or yearbook.

The current writing models are suited to the gifted because of their cognitive view of writing. Rather than the emphasis being solely on punctuation, spelling, grammar, and end product; the emphasis is thinking and problem solving as it relates to the process of writing. Additionally, writing should be a process of discovery and gaining knowledge for the gifted. Through the act of writing students discover new information and think critically about what they have written. This allows for the increased opportunities to deal with language on a sophisticated and complex level and taps into the cognitive processes of the gifted student.

Another addition to the reading/language arts curriculum that research has

shown to be effective with gifted students is dramatics. Dramatics gives the gifted student the opportunity for performance and and a long term project. Drama also provides the opportunity for affective and social development that can be overlooked in reaching the intellectual challenge of the gifted. Unstructured creative drama gives the gifted student the opportunity to utilize his or her imagination and to work cooperatively in the creation of a shared experience (Robinson, 1996).

Overall, the reading/language arts curriculum for the gifted student needs to include individualized reading, projects, research, and writing that crosses all disciplines including technical writing. It should also include drama as the creative outlet that fosters the social emotional development of such a student.

Conclusion

The curriculum and teaching methods for the gifted need to emphasize presentation, discussion, and inquiry. The curriculum must focus on high level conceptual material within the subject matter. It must also include the opportunity for students to investigate, elaborate, and structure their own approaches to understanding.

There needs to be daily assignments of homework, research, and independent activities. Teachers need to lecture key concepts and processes. They should have substantial discussion and activity orientated assignments centered around the subject matter. They should allow time for inquiry, problem solving, and other investigative activities (Feldhusen, 1991). Classrooms need to be well equipped with books, supplies, technological equipment, lab equipment for science, reference resources, critical literature, and movable seats that foster group work and investigative projects.

The crucial factor in any program or school for the gifted is to provide challenging instruction at a level appropriate to the abilities of the student. This should be coupled with stimulation to strive for high level achievement and

excellence.

Chapter 3

Design, Methodology, and Procedures

The purpose of this study was to investigate the reading/language arts and mathematics curriculum for six through eighth grade gifted students in a private school for the gifted. The study sought to examine the effectiveness of the curriculum in meeting the needs of this particular population. The study sought to determine the effectiveness in developing the critical thinking and problem solving skills of the gifted population.

Qualitative Research

Qualitative research has become a strong method in research. The use of descriptions and contextual explanations allows for insight into the study of human behaviors and interactions (Patton, 1980). Qualitative research formulates questions to be investigated which determine the context in which behaviors or situations occur. In qualitative research the study becomes sharper and thicker as the data are collected (Bogdan & Biklen, 1982).

In addition, qualitative research allows the investigator, through the notation of causal relationships, to draw conclusions early on in the data collection process. This leads to expanded areas of inquiry and the generation of research questions instead of hypotheses (Glaser & Strauss, 1967). The research questions help define and direct theoretical assumptions and enable the researcher to understand behavior from the participants' frame of reference (Miles & Huberman, 1984).

This study was a non-experimental, qualitative, evaluative design utilized to depict the curriculum of gifted students in a private school.

Procedures

Sample Selection and Participants

This study was conducted in a private parochial school for the academically gifted in Central Illinois. The school selected served grades four through eight. The

focus was the reading/language arts and mathematics curriculum for the students in grades six through eight. The participants included all students in grades six through eight for a total of over 75 students and the five teachers responsible for instructing these subjects.

Entry

The researcher met with the principal of the school and requested access to the school to evaluate the curriculum and its effectiveness with gifted students. The President of the Board of Directors and the Principal both received a letter notifying them of the study and requesting permission to do the study. This researcher then met with the faculty to discuss the purpose of this evaluative investigation. Participation was voluntary and each person was given the opportunity to deny the request for observation or interviews. In a gesture of reciprocity for the stakeholders the researcher agreed to give a copy of the completed study to the Board of Directors, the Principal and the faculty. The researcher agreed to the anonymity of the school.

Data Collection

Interviews

Interviewing is a valuable tool for building a conceptual framework from the experience of the participant. The interview is a process that allows the researcher to elicit meaning as perceived by the participant. The dialogue that occurs may result in unexpected findings which lead to the emergence of new themes to be tested and pursued. As the new themes emerge, the researcher evaluates them by asking the participant how it relates to her experience. The researcher compares and contrasts the information that is collected through the generation of verbal documents (Miles & Huberman, 1984).

In this study the teachers responsible for instructing reading/language arts and mathematics were interviewed at their convenience. The number of teachers interviewed were five. Two interviews were held for each teacher. The length of time

for each interview was 60 minutes. The interviews took place during their planning periods. Extensive notes were taken and then transcribed following the interview. In addition, informal conversations were held any time the researcher observed a particular teachers' class.

In addition, fifteen students from each of the grades sixth-eighth, who volunteered to be interviewed, met with this researcher during their lunch and recess period. The interviews were 60 minutes in length. Again, extensive notes were taken and transcribed following each interview. These interviews were held between mid January 1997 and mid April 1997.

Observations

Observational data provides a description of the setting being studied, the activities that take place in that environment, the people who participate in the activities, and the meaning of the setting, activities, and their significance to those people (Patton, 1980). There are many advantages to the observational method of collecting data. Through observation the researcher can select later informants who may shed additional light on the emerging theory, thereby enabling the researcher to modify categories and provide meaningful analysis to the problem under study. The researcher, through observation, may absorb tremendous information that initially may seem irrelevant but may prove to be valuable in clarifying perspectives. As an observer, the researcher is better able to avoid misleading and meaningless questions. Finally, the impressions obtained through observation are generally more reliable in classifying participants' subjectivities and orientations than the information based on questions in a questionnaire or straight interview (Huberman & Miles, 1988).

In this study the main focus was evaluation of the curriculum. Therefore, several observations were held in each of the investigative areas. Reading/language arts and mathematics classes were observed for each grade sixth through eighth. Each class was observed a minimum of two times. The researcher employed the

method of script taping whereby descriptions are written down from a wide lens view of the instruction. This researcher noted the content and presentation of the academic area, assignments given, in class activity, and long range projects. The researcher obtained copies of the lesson being presented the day of each observation.

Documentation

In order to provide a balanced analysis of the curriculum this researcher reviewed textbooks, instructional materials, assignments, and projects completed by the students. Documents such as the above give a source of data that adds to a credible review of a curriculum.

Data Analysis and Interpretation

The researcher employed a method of recording known as fieldnotes. Fieldnotes are descriptive records of observations, interactions, and activities that take place. Fieldnotes allow the researcher to return to the setting by reading over descriptive notes that contain direct quotes and which detail the researcher's insights and interpretations. The researcher is able to develop working hypotheses regarding the setting and the researcher's feelings and reactions to what is happening (Patton, 1980).

The analytic memo is the reflective portion of the fieldnotes. The analytic memo contains sentences and paragraphs that reflect the researcher's personal account of the inquiry (Bogdan & Biklen, 1982). Analytic memos provide information regarding emerging themes and patterns, dilemmas, conflicts, and the observer's own frame of mind. Therefore, the analytic memo assists in the study's design and serves as an ongoing process in analysis.

Data Collection Analysis

Data analysis is a process of taking the interview transcripts, observations, fieldnotes, and additional documentation and systematically analyzing the materials to increase the researcher's understanding of them so that the discovery may be

presented to others. This method allows the researcher to fill in gaps and test emerging hypotheses during analysis which generates strategies for better collection of quality data (Miles & Huberman, 1984).

Once the data was collected the researcher developed codes to facilitate analysis. Codes are categories that enable the researcher to retrieve and organize the information into particular segments. The researcher, through coding, identified patterns and regularities as well as topics within the data. After the data was collected and coded the codes were clustered to set the stage for the emergence of themes within the study.

Limitations of the Study

Qualitative data are rich, thick, and well grounded. They aid in gaining insight into the behaviors and interactions from the participants' point of view (Bogdan & Biklen, 1982). However, as with any study, there are limitations. The limitations of this study included:

Sample

Generalizations from the findings of this evaluative study are limited to the populations with similar characteristics. The population was limited to gifted students in grades six through eight in Central Illinois. Therefore, caution should be noted in generalizing the results.

Time

Since this study was not longitudinal, the researcher only had a view of the participants from January through April 1997.

Methodology

The methodology may impose limitations due to its less structured and more fluid approach of interviewing. Interviewing allows for in-depth questioning by the researcher but the emphasis of the questions may vary due to the different responses during individual interviews. In addition, observations were part of the data

collection. Observations can lead to problems in defining constructs, noticing all events, and recording all facets of the observation.

Chapter 4

Findings

The school selected was a private parochial school for the academically gifted in Central Illinois. The school has a total enrollment of approximately 130 students. The grade levels of the school begin at fourth and go through eighth grade. Once the students graduate from this school they either attend a public high school or a parochial high school. There is no high school for the academically gifted in the area. School begins at 8:10 in the morning and ends at 3:15 in the afternoon. There are eight forty minute periods, seven that are academic times, one that is an academic elective, and one period for lunch. All students take English, Literature, Social Studies, Mathematics, French, Science, Religion and a daily elective. In addition each grade level spends two periods a week in the computer laboratory.

English, Literature, and Mathematics classes were observed in grades' six through eight a minimum of two occasions. Textbooks and instructional materials were reviewed. Students in grades six through eight, who volunteered, were interviewed to discuss their opinions and perceptions regarding the three academic areas being investigated. The students were asked to share their perceptions regarding their school and the relationships with one another and their teachers. In addition, informal conversations were held with the teachers observed. Interviews were held with the mathematics, literature, and english teachers for grades six through eight.

Upon entering this school one was immediately struck by the open, inviting, warm, and nurturing environment. The children were proud of their school. This was demonstrated by their approaching the researcher from the very first day with information regarding their school. The students were excited and delighted to show the researcher the work they were doing and to talk about how wonderful their school

was. The students were informative, polite, courteous and interactive.

The teachers displayed characteristics of dedication, professionalism, and concern regarding the school, the students, and one another. This was evidenced by the inviting classrooms that contained several displays of the students' work. In addition, the teachers and students continually interacted with one another. The researcher could sense the comfort level and friendships that had developed between the teachers and students. Yet, boundaries were kept in place as demonstrated by the respect that the students held for their teachers. There was a mutual respect between teachers and students and a learning environment where both the teachers and students explored learning together.

The principal of this school was new. She was the French teacher for several years and had just been appointed principal. She was a warm, caring, individual whose main focus was the children and providing them with the best education possible.

Overall the climate of this parochial school for the gifted was one of support, nurturance, collegiality, and collaboration. There was a clear sense of "family." The climate was conducive to learning and exploration on the highest level.

Language Arts

Literature

The students took a literature class where reading and writing skills were developed. They also had an english period where grammar and vocabulary were instructed. Literature and english classes were observed for grades six through eight. Textbooks, literature books, and other instructional materials were reviewed.

The literature and english classes definitely followed the content mastery model whose goal is to have gifted student progress through a curriculum at an accelerated rate. The materials used included texts and literature books at least one year above the actual grade level and in some instances the students stretched

beyond this. The teachers had freedom in selecting the books rather than the entire school subscribing to a particular series. This freedom of choice allowed for a rich literature and english program. By allowing the teachers to select what they felt was appropriate and interesting allowed them to determine the curriculum based on the needs of the students from year to year.

In literature, the concept based model was employed along with the content mastery model. The concept based model places emphasis on the understanding of systems of knowledge as opposed to factual information. The students focus on the thoughts and principles that influence human development. This model allows for the teacher to pose questions that will stimulate the students into discussion and lead to higher levels of understanding.

In sixth grade literature the students had been working on the story "The Westing Game." This piece of literature is a murder mystery that requires high levels of critical thinking in order for the students to solve the mystery. The students were engaged in solving the mystery by understanding the characters. This was done by discussing human development and characteristics that may or may not lead a person to commit a crime.

One method of instruction used by the teacher was cooperative learning groups referred to as literary circles. The students were placed in groups. Within each group a students job was rotated; thereby giving every student the opportunity to work in various capacities. There was a checker whose job was to ensure that everyone played their part in the discussion. There was a literary luminary whose job was to identify three passages for discussion and/or oral reading. The discussion director called the group to order and developed a list of questions that the group discussed. The students were encouraged to use their own reactions to the passage for the discussions. Finally, there was the vocabulary enricher whose job was to look for new, interesting, or unfamiliar words that the group may want to talk about. The students

were instructed to compile a list of at least 4-6 words. The process was utilized for the entire book. The students read the book on their own first. Then they reread sections while working within their groups. The teacher then lead the students in a class discussion bringing together all the ideas from the different groups. The teacher through questioning checked content knowledge and explored critical levels of thinking.

The method of content mastery and concept based model was also used in seventh and eighth grade literature. In seventh grade literature the students read the book Hiroshima and analyzed it through class discussions. In addition, the teacher team taught with the social studies instructor combining the literature piece with the social studies curriculum.

In eighth grade the students studied "Romeo and Juliet." The teacher employed content mastery through oral reading and evaluative questions related to the story. Through inferential questions and problem solving questions the students entered into a concept based model of inquiry. The students were encouraged to give their interpretations to the story. The teacher had the students compare the story to the current movie that had been released, which set "Romeo and Juliet" in the twentieth century.

The process/product model develops skills needed to conduct first hand investigations of topics that are of interest to the student. This model does not follow a set curriculum and emphasis is on an in depth study of a particular topic. It was evident through the cooperative literary groups and literature projects that the students were encouraged to develop investigative skills. However, the process/product model means emphasis and an in depth study of a particular topic and should have been incorporated as part of the literature curriculum.

This school fully engaged in the process/product model during their two week immersion program. During this study, the school engaged in an immersion study of

the 1940's. All students, for two weeks, studied the time era of the 1940's. The students read literature of the time, investigated the technology of the 1940's, studied the history and economics of the 1940's, learned songs and dances of the times, and engaged in artistic projects and research related to this period.

English

English instruction involved grammar and vocabulary instruction. English was taught in the content mastery model where the students were taught particular units of study. The english curriculum was at an accelerated pace. Students were taught the discrete skills of grammar necessary to good writing and communication. The students engaged in practice drills and writing assignments geared toward grammar enhancement. The instruction of english is not an academic area that lends itself to either the process/product model or the concept based model. However, the teachers engaged the students in explaining the reasoning behind the various grammatical rules.

It would have been possible to incorporate english to the broader based language arts program whereby the discrete units of grammar could be instructed along with literature and writing. This would have enabled the teachers to incorporate all three learning models into one academic area. However, the importance of teaching english should not be diminished.

Mathematics

The mathematics classes were divided into two smaller groups, the average and the advanced, for grades six through eight. The mathematics classes were student centered. The placement of students into smaller groups allowed for more individual attention and teacher/student interaction. The mathematics curriculum utilized all three models of instruction for the gifted.

The teachers, through the content mastery model, instructed the students on the discrete units of information such as computational skills, algebraic and

geometric formulas, and statistical equations. The content portion was only a small part of instruction.

The major focus was on process/product and concept based instruction. Concept based instruction in mathematics has students pose questions and develop solutions to them. It also has teachers pose questions that the students are expected to answer and discuss the methods that they employed.

For example, the sixth grade students in one observation engaged in mental math. The teacher posed the following questions: 1. Estimate the sum of 68 and 240. 2. Start with 10 subtract 8 add 5 double and add 10. 3. What is the perimeter of a rectangle that has the length of five inches and a width of three inches? 4. Give the exact answer to 639 divided by 9. 5. Change 14/6 to a mixed fraction.

The teacher required the students to work through these problems mentally. Then through class discussion the students gave their answers and explained the process they used and why. The teacher was careful not to inform a student that an answer was wrong but rather encouraged an explanation as to their thinking.

In a seventh grade mathematics class the students were posed with the following mental math questions: 1. How many feet equal one mile? 2. Write 7/4 as a mixed number. 3. What is the area of a square that has one side measuring 9/10 of an inch? 4. What is the perimeter of a square with each side measuring 9/10ths of an inch? 5. What is the smallest whole number?

Again the teacher required the students to provide their answer and explain the reasoning behind it. The teacher went beyond the mere mental math activity and sought to determine if the concept was understood. The students' responses were accepted if they could rationally explain their reasoning behind the answer given. By utilizing this approach students were able to see their own errors. The concept based approach allows students to "talk through" their own answers that enable them to make any corrections.

The process/product model of instruction for mathematics requires that students investigate a problem at hand and give solutions to it along with implications for daily living. For example, in a seventh grade mathematics lesson the students were critically thinking about measurements and the importance of being accurate. The students through discussion came to the conclusion that estimating measurements can have some serious repercussions. One student explained that an estimated measure done with blood work in a doctor's office could lead to an incorrect diagnosis of a patient's condition. Another student stated that estimated measurement by an anesthesiologist could cause a patient to die. Still another student stated that the space probe orbiting the planet Pluto could miss the planet by miles if off by a mere one-quarter of an inch. It was evident that mathematics for the students at this gifted school went well beyond content and strongly focused on concept and process/product.

Students

Twenty-eight students from sixth, seventh, and eighth grade volunteered to be interviewed by the researcher. The children voluntarily gave up their lunch and recess time to talk with the researcher. The students were open, honest, and eager to share their thoughts and perspectives regarding their school. The majority of the students wanted to continue beyond the allotted time. Their thoughts, insights, and perceptions were remarkably astute and correlated strongly with the observations that had been made.

The students were asked several general questions. Subquestions were formed based on their responses to the initial questions. The students were asked to describe their school. They were asked what made it different from other private and public schools. They were asked to describe the strengths of their language arts and mathematics curriculum as well as to discuss what changes they would make to these programs.

The students responses to the question concerning the climate and programs of their school provided enlightenment as to the success of this school. The students described a school that provided a family environment. As one student stated:

> We're a family. We do stuff, we don't just sit around and listen we all work together. The teachers are our friends and you can talk to them about anything. We have more freedom to choose interesting topics to learn it's a family that's what it is.

Several students reiterated these words in one form or another. The students referred to the school as "challenging," "close," and "caring." This sense of family made the students feel free to express themselves and interact with their teachers on a personal level. This family environment was evident. Teachers and students interacted comfortably. Students were not afraid to approach a teacher and teachers were willingly to go along with a students' ideas related to instruction.

The students talked about a level of trust that existed between them and their teachers. They described their school as being "safe, no violence here as you find in the public schools." However, they were quite cognizant of the fact that this safe orderly environment was because they were a private school. One student felt that this concept could be brought to the public schools, "all they have to do is create schools within schools, this environment can be recreated in public schools."

Students' Views on Language Arts

The students openly and honestly described their language arts and mathematics curriculum. In discussing language arts the students indicated that they enjoyed the diversity of how the curriculum was presented. They talked about the literary circles. "The literary circles help us get more information, a better understanding of the book." As another student stated, "By working in teams of five or six you get better answers." Another student commented "The literary circles allow us to make our own interpretation of the book." This answer related to the concept based model that emphasizes posing questions that stimulate discussion on

key issues that students explore. The students indicated their enjoyment of projects that allowed them to explore topics of personal interest.

The students also stated that they saw tremendous merit and benefit to having english taught separately. As one student stated, "English is individual, I mean you have to learn those grammar rules, it's important if you want to read and write well." However, even though they felt that the instruction of english needed to be content based they indicated the desire to incorporate it into a concept based model. "I think that we could learn the basics and then create a project around our grammar lessons, that would make it more interesting." As another student so eloquently stated: "English is boring. I understand why we need to learn it but I think we can make it more fun if we did some sort of project." An eight grader stated; "It can get boring memorizing grammar rules, but without good english you can't communicate."

When presented with the opportunity to discuss what changes they would like made to the language arts, there were two major themes. The first was the incorporation of the concept based model with the content based model. The students clearly understood the merits of learning english and did not want that eliminated. They just believed that it could be incorporated into a more project based class. The second theme was related to the process/product model. The students indicated that they would like more long term assignments that integrated with other curricular areas. They indicated that they enjoyed their immersion program and would like to do more of that.

> More group projects, that's what we need, long term group projects. It allows us to be more creative. We can study and work on lots of topics at once, like we do in our immersion program. Yep that's what we need.

Students' Views on Mathematics

The students discussion regarding the mathematics curriculum was as open and honest as their dialogue regarding language arts. The students were divided for

mathematics into the "average" group and the "advanced" group thereby making class size smaller. The students indicated that this was extremely effective because it allowed them to move at a quicker pace, receive more individual attention, and engage in more projects due to the homogeneous nature of the groups. Students in grades six through eight alike strongly indicated their preference for this arrangement.

> It gives us more individual attention which I think is needed in math. It also allows us to move at our own pace and we get to do a lot more projects by having smaller classes. By having smaller classes we get do ask more questions I like that...plus we get to do more projects so it's not just memorization and problem solving, its doing things related to life.

The students had nothing but positive things to say about the mathematics curriculum. They discussed all the components of the mathematics program. The students relayed examples of problem solving activities they engaged in. They talked endlessly about the mathematical projects and how they dialoged with their teachers regarding how a particular area of mathematics related to the outside world. The students indicated that memorization was minimal. However, they saw value in what they were required to memorize. As one student stated:

> You need to know your multiplication tables and things like measurements. It is a lot easier when you have memorized those things so that you can concentrate on problem solving and doing different projects.

The students enthusiastically talked about mathematics projects they had worked on in previous years and what they were currently engaged in. At the time of the interviews the researcher had observed the mathematics lesson on measurement. The students were eager to share their perceptions of that lesson.

> It was really neat, I mean cool. We needed to learn certain measurements but it was great when we talked about why it was important to be as precise as possible. I mean can you imagine building a house and only estimating the measurements!! (laughing) I wouldn't want to live in that house. It's great learning math this way, it makes it real, it makes it important.

It was evident from the students' descriptions combined with the observations that the mathematics curriculum engaged all three models of instruction for the gifted supported by researchers. The mathematics curriculum engaged the content mastery model, the concept based model, and the process/product model in an integrated manner that makes the curriculum rich and relevant to the needs of the students.

Teachers

The three teachers who instructed language arts and english were observed on several occasions, spoken to informally, and interviewed. Both of these teachers appeared to enjoy their teaching positions. They were enthusiastic about the students and the curriculum. They expressed their satisfaction with the flexibility they had in developing and instructing language arts and english. As one teacher stated:

> We use a novel approach versus the basal reader, it is very flexible. We review reading skills but it's not the emphasis. The stress is on higher level thinking, bringing relevance to life, relating current events to literature.

When asked about curriculum instruction, the teachers described the various activities and modalities of teaching that the students had. They discussed the merits of learning grammatical skills, the use of literary circles, thematic units, short term projects and work assignments developed by the students. They discussed the importance of the curriculum being accelerated as well as integrative and interdisciplinary. They discussed the importance of relating the curriculum to topics that were of interest to the students that led to in depth investigation and study. The language arts and english teachers described classes that were student centered and full of action.

> It's important to work with intrapersonal skills. The students are strong in their own ideas and beliefs. They are able to relate well to adults. The students are very divergent thinkers as most gifted children seem to be. They have to have the freedom to think differently. Their reasoning at

> times is interesting but I tell them that as long as they can support their answers it is acceptable.
>
> I have them write a theme every week, they do a rough draft and then a final draft. They make a lot of their own work sheets, so much more thinking is done this way. Application is difficult particularly in writing but it all happens.

The two teachers who instructed mathematics for the sixth, seventh, and eighth graders were observed and spoken to informally on several occasions. They were interviewed once. Several attempts were made for the second interview but schedule conflicts on both the part of the teachers and researcher made it difficult to achieve. However, the observations and the interviews with the students provided rich and complete information concerning the mathematics curriculum that went beyond the information provided by the mathematics teachers.

Chapter V

Summary, Conclusions, and Recommendations

The evaluation of the language arts (literature and english) and mathematics curriculum at this parochial school for the gifted proved to be enlightening. The study sought to investigate whether the language arts and mathematics curriculum were meeting the needs of the gifted child. It also sought to determine if the curriculum challenged their problem solving and critical thinking skills. Through observations, review of instructional materials, fieldnotes, interviews with students and teachers, comprehensive answers to the above questions were obtained.

The researcher evaluated the curriculum according to the models for gifted education as discussed by Berube (1994). Berube discusses three models; content mastery model, concept based model, and the process/product model. Both the language arts and mathematics program used the content mastery and concept based model approach. The mathematics curriculum also engaged in the process/product model.

The content mastery model seeks to move the gifted student through the curriculum at an accelerated rate. Mastered material is eliminated from the units of study and the students move at a faster rate.

In both language arts and mathematics the sixth through eight grade students at this school were engaged in the content mastery model. The textbooks, novels, various instructional activities were all operating at an accelerated rate. Content and skills were instructed at a faster rate and there was little repetition of discrete instruction. This is appropriate. Gifted students do not need to have repetitive units of instruction occur within a given curriculum. In mathematics the students were broken down into smaller groups to accentuate the ability to accelerate the students.

The concept based model emphasizes understanding of systems of knowledge

as opposed to factual information. In a concept based model students focus on the relationship of key issues to a variety of subject areas across the curriculum. Students are led through interesting discussion that heighten levels of understanding. The students may also focus on principles that have influenced human development. Again, both the language arts and mathematics curriculum incorporated the concept based model.

This was evident in language arts through the literary circles, for example, which focused on the students' ability to utilize various systems to problem solve and critically analyze literature. The literary circles provided the students with the independence to work with their peers and engage in discussions that challenged their thinking. The students were given assignments that gave them the opportunity to discuss the importance of a piece of literature as it relates to the world around them.

The mathematics curriculum also interwove the concept based model with the content based model. This was observed each time the researcher viewed a mathematics lesson. The teachers posed various questions, such as the mental math presented in Chapter Four of this paper, and lead the students into discussion surrounding the reasoning for their answers. This allowed for the students to understand the system behind mathematics, not just rote memorization of computational skills. In addition, math assignments focused on the students' ability to reason and explain the system of knowledge utilized to gain their answers.

The process/product model involves an in depth study of a particular topic. It places emphasis on students developing solutions to real world problems. This model also reflects what a student has learned about a particular topic through presentations to various audiences.

The process/product model was incorporated within the mathematics curriculum. This was observed during the lesson on measurements where the students discussed the relevance of precise measurement to everyday life. The

various observations of the mathematics curriculum revealed that discussions such as the above were activated for each new concept presented. The students were constantly encouraged to utilize their knowledge of mathematics to develop solutions current to the needs if the environment in which they lived.

The process/product model was explicitly utilized in the two week immersion program that occurs every year at this school. This innovative program takes a particular topic that the students investigate for a two week period. The investigation is a complete immersion into every curricular area based on the topic that has been selected.

During the time of this evaluative study the topic for the immersion program was the "1940's." For a two week period the students engaged in an in depth investigation into the 1940's. They studied the literature and writings of those times. They investigated and reported on the technology, scientific discoveries, social plights, and historical events. The students engaged in creating a mural that represented that time. The culmination of the immersion program was a production of song and dance from that era.

The students became completely engaged as demonstrated by the extraordinarily comprehensive presentations and reports that they produced. The students expressed appeared to find this method of instruction most conducive to their learning needs. As one student stated: "I wish we could have immersion all year long." The immersion program was an exceptional example of the process/product mode. Consideration should be given to doing this twice a year instead of once.

Summary and Recommendations

Overall, the mathematics and language arts curriculum at this parochial school for the gifted appeared to be comprehensive, effective, challenging, creative, and met the needs of the academically gifted and talented student. The curriculum focused on the development of the thinking process, was integrative, and allowed for

independent study and projects. Both the language arts (literature and english) and mathematics curriculum incorporated the content mastery and concept based model. In addition, the mathematics curriculum fostered the process/product model. The immersion program was an excellent example of the process/product model. As the research states no one model is completely effective nor does one particular model lead to all the curricular areas for the gifted student. However, an incorporation of all three models creates a holistic and challenging curriculum for the gifted population.

The researcher recommended that the school should consider incorporating the process/product model into the literature and english classes. The most effective manner would be to incorporate writing with english. This would enable discrete units of grammar instruction along with the writing process. This would foster the process/product model. Finally, increasing the immersion program to twice yearly was suggested.

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